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Construction and validation of Life Regrets Scale for elderly people in Pakistani culture

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ABSTRACT. Questo studio mira alla costruzione e alla validazione della *Life Regrets Scale* per gli anziani nella cultura pakistana. Nella prima fase dello Studio I, è stato sviluppato un pool di item iniziale basati sulla teoria dello sviluppo psicosociale di Erikson e sulle risposte date da un campione di anziani del Pakistan ad alcune interviste semi-strutturate. Nella fase II invece è stato condotto uno studio pilota. Dopo aver verificato la validità di contenuto, nella fase III sono state determinate la validità fattoriale e la coerenza interna utilizzando un campione di 506 partecipanti, inclusi anziani di sesso maschile (*n* = 317) e femminile (*n* = 189) con un'età minima di 60 anni. L'analisi fattoriale ha rivelato una soluzione a tre fattori che spiegava la varianza cumulativa del 32.63% con un'alfa di Cronbach pari a .92. I fattori sono stati denominati rispettivamente rimpianti familiari, rimpianti religiosi e rimpianti relativi alla crescita personale. Inoltre, nello Studio II, l'analisi fattoriale confermativa ha convalidato la struttura a tre fattori con un eccellente indice di model fit. Lo Studio III ha rivelato una correlazione positiva significativa della *Life Regrets Scale* con la depressione e l'ansia per la morte mentre ha mostrato avere una significativa correlazione negativa con l'integrità dell'io e la qualità della vita percepita. I risultati dello Studio III hanno fornito una forte evidenza della validità del costrutto della *Life Regrets Scale*.

SUMMARY. The present study aimed at construction and validation of Life Regrets Scale for elderly people in Pakistan culture. In the first phase of Study I, an initial item pool was developed on the basis of Erikson's theory of psychosocial development and semi structured interviews from old people of Pakistan. A pilot study was carried out in phase II. After ensuring the content validity, factorial validity, and internal consistency were determined in phase III on a sample of 506 participants including both older men (n = 317) and women (n = 189) with a minimum age of 60. Factor analysis revealed a three factor solution that accounted for 32.63% cumulative variance with .92 alpha reliability. Factors were named, familial regrets, religious regrets, and personal growth related regrets respectively. Moreover, In Study II, confirmatory factor analysis validated the three factor structure with excellent model fit indices. Study III revealed a significant positive correlation of the Life Regrets Scale with depression and death anxiety while Life Regrets Scale appeared to be a significant negative correlate of ego integrity and quality of life. Findings of the Study III provided strong evidence for the construct validity of the Life Regrets Scale.

Keywords: *Life regrets, Elderly population, Construct validity, Reliability*

INTRODUCTION

Regret is considered to be one of the most commonly experienced emotions in everyday life. Regrets are frequently discussed with relevance to older adults because after passing their life they look at their past and evaluate their decisions, choices and relationships (Jokisaari, 2004; Newall, Chipperfield, Daniels, Hladkyj & Perry, 2009) According to Erikson (1959), positive evaluation of past results in life satisfaction and a feeling of integrity among older adults. On the other hand, if people feel that many decisions taken by them were wrong and their interpersonal relationships were also disturbed, they may experience remorse over their decisions. Resultantly, regrets dominate the lives of old people. These regretful thoughts lead to the feeling of despair.

Regrets are defined as feelings of guilt and remorse which emerge when people fail to obtain their preset goals. Regret is marked with painful thoughts and it is overwhelmed with the emotions of feeling sorry for misfortunes, losses, limitations, mistakes, and transgressions (Landman, 1993). Cognitive processes such as counterfactual thinking are usually involved in the experience of regrets, while people think of "what might have been" if they had chosen something different or made another decision (Van Dijk & Zeelenberg, 2005). These thoughts are mostly related to their education, work, marriage, and family etc. (Roese et.al., 2009).

A previous study shows that an awareness of the loss of opportunities is painful in older age and it produces severe regrets (Beike, Markman & Karadogan, 2009). Literature indicates that there are two most common types of regrets; regrets of action and regrets of inaction. According to Roese (2005), regrets for actions and inaction can be described as wishing that you had not done something you did and wishing you did do something you did not do respectively. Gilovich and colleagues (Gilovich, Wang, Regan & Nishina, 2003) carried out research on the difference of action and inaction regret between individualistic and collectivistic cultures. They demonstrated that individuals belonging to collectivist culture might experience fewer regrets of inaction and greater regrets of action. While individuals as part of individualist culture might experience more long-term regrets of inaction than regrets of action. Another study conducted on regrets described that people mostly regret about "what they could have done" rather than "what they did wrong" in their lives. This study indicated that people have greater regret of inactions than actions that haunt them for a long period (MacLellan, 2018).

Literature shows that every culture has different grounds of regrets. People feel regrets in various situations and the intensity of regrets varies depending on their social and cultural context. For instance, researchers described that Americans feel more regret in self-situations while Japanese experience more regret in interpersonal situations (Komiya, Miyamoto, Watabe & Kusumi, 2010). Research conducted on the Pakistani population reflected that interpersonal and religious regrets are being strongly experienced by elderly people (Ghayas & Batool, 2016). Another psychological research conducted on life regrets and aging showed that regardless of culture, regrets are mostly caused by negative emotions associated with troubling past decisions. At older age people analyze their whole life and feel remorseful about the wrong choices and decisions they have made for themselves and their family (Tassone, Reed & Carstensen, 2019). McKee and colleagues (McKee et al., 2005) conducted research on the British old people and they concluded that regrets of old age were found to be related to psychological issues. Jokisaari (2004) conducted research on the old people of Finland and he revealed that old people experience more work and relationship related regrets as compared to other regrets.

The nature of life regrets vary depending upon a person's age and gender. Younger adults tend to experience fewer regrets as they are more active and ambitious. They typically look for better opportunities. They use different ways to undo the consequences of regretted actions. On the other hand, older people experience more intense regrets because they perceive less opportunity to compensate for the negative outcome of regretted actions. So the intensity of regrets increases with age which causes a detriment in quality of life (Wrosch & Heckhausen, 2002). Older adults recall positive events: good times with their friends and family and avoid thinking about negative events (Magai, 2008). Gender differences also bear upon how regret is experienced. A study describes that unresolved past problems such as regrets may negatively affect women's lives throughout middle age and beyond (Jokisaari, 2004). A survey conducted on men and women demonstrated that overall, 44% of women reported romantic regrets while just 19% of men experienced romantic regrets. These findings depict that men have a greater tendency to replace the lost relationship quickly with new people. This study also points out that people who are not in a current relationship, understandably, experience greater

regrets about past relationships (Ambreen & Samer, 2015).

A lot of researches have been conducted on life regrets and some scales are developed on regrets of different populations (Buchanan, Summerville, Lehmann & Reb, 2016; Pethtel, 2012; Tomer & Eliason, 2005). All these scales were developed for different cultures and validated on different age groups. A previous qualitative study conducted by Ghayas and Batool (2016) provided evidence that there is a certain type of regrets which are unique to our culture and which have not yet been reported by any other study.

Considering the importance of regrets in old age, the current study was undertaken to develop a scale specifically for Pakistani elderly people. Though various types of scales have already been developed for various age groups of other cultures but no scale was found completely suitable for Pakistani elderly people in terms of cultural relevance. Furthermore, this scale was meant to measure the regrets of the only older population as already existing scales were devised for a wide age range. This study was designed to get a clear picture about the regrets that are directly and indirectly influencing the mental health of old population in Pakistan.

METHOD

Study I comprised three phases. An initial pool of items was generated in phase I and psychometric cleansing of items were ascertained through a pilot study in phase II while selected items were administered on 506 participants (older men and women) in phase III. The data was statistically analyzed to assess the psychometric properties of *Life Regrets Scale*. Factorial validity of the scale was also assessed. Item total correlation and alpha reliability was determined. In Study II, confirmatory factor analysis was carried out on an independent sample of two hundred elderly people to confirm the factor structure of the newly developed life regret scale. Study III is an independent study designed to check the relationship of life regrets with relevant correlates in order to establish the construct validity of the scale.

Study I: Development of Life Regrets Scale

– *Phase I.* In phase I, an item pool was generated. Initially, literature review and expert opinion were consulted. Secondly semistructured interviews with older adults (15 males and 15 females, age range 60 to 80 years) were conducted. Older adults were asked about their regrets and about their past life (e.g. "What comes in your mind when you think about your past life", "If you will be able to go back in your past then what type of changes you will bring in your life"). On the basis of literature review, expert opinion and data generated through semistructured interviews, an item pool was generated in the Urdu language. Originally developed 74 items (based on literature and public opinion obtained through interviews) that sampled the domain of life regrets were pooled up. Seventy four items scale was given to six experts (2 lecturers and 4 assistant professors of Psychology Department) for a critical item review. Deletion of certain items was suggested by them. They also added some items. Some of them were rephrased and some others were deleted. In order to ensure the clarity of language and face validity of statements, the item pool was presented to a committee comprising 4 judges (1 associate professor, 1 assistant professor, and 2 lecturers of Department of Psychology). Through consensus, the 84 items scale was developed on the basis of selection criteria. Initially, independent judgments were taken, and then items were finalized in a form of a committee approach. There was complete consensus about the items because items in the scale were having excellent content and face validity. The sequence of items was shuffled to arrange the items in a general to the specific order in terms of content. Finally, the selected items were written in the form of scale. The response format of life regrets scale was decided to be 5 point Likert type such as 1 = never , 2 = a little, 3 = sometimes, 4 = very often to 5 = always. In order to reduce the response bias, 5 items were negatively phrased.

– *Phase II: Pilot study.* A pilot study was conducted to ascertain the psychometric properties of 84 items life regrets scale. The purpose of the pilot study was also to exclude the unclear, ambiguous, and overlapping statements and to ensure the understandability and accuracy of items in the scale.

Sample. Sample of the study comprised 90 participants which included both males (n = 49) and females (n = 41). The age of sample ranged between 60 to 82 years (M = 65.51, SD = 6.06).

Instrument. Initially developed 84 items scale was used in pilot study which was scrutinized by a committee of researchers and psychologists.

Procedure. The topic of the research was reviewed and approved by the Internal Review Board of Department of Psychology. The participants of the study were approached at different venues. They were briefed regarding the purpose of study. Keeping in view the ethical considerations, participants were ensured that their information will be kept confidential. After taking informed consent from participants, the questionnaires were distributed with written instructions among the willing participants. It took about 20-25 minutes to complete responses on scale. Their queries regarding items were clarified. Interestingly participants took interest in the test administration process. In the end, participants were thanked for their cooperation.

Results. Viability of the items in the *Life Regrets Scale* was examined through a pilot study. The final number of items for factor analysis was selected. 7 items (2, 3, 4, 5, 11, 27 and 38) out of 84 were excluded due to non-normality. Responses on these seven items were similar across all the participants therefore these items were not able to make difference among participants therefore it was decided to remove these items. According to Gregory (2014), only those items should be retained that can make difference among participants if all participants are responding in an almost similar way then this type of item should be removed. Eight items (6, 7, 8, 28, 31, 40, 45 and 48) were deleted due to negative correlation and six out of these eight items were negatively phrased. The reason behind negative correlation may be ambiguous phrasing and difficult wording of items. Nine items (34, 35, 46, 56, 63, 65, 67, 69 and 73) were removed due to criticism by participants as participants felt offensive towards items related to past immoral acts. Some items were emotionally loaded and some were socially desirable and others were not clear to older adults. Sixty items were selected for further factor analysis.

– *Phase-III: Dimensionality and reliability of Life Regrets Scale.* In order to ensure the final structure of *Life Regrets Scale*, factor analysis was conducted.

Sample. Sample of the study comprised 506 older adults including males ($n = 317$) and females ($n = 189$). The data was collected by using a convenient sampling technique. The literacy rate of elderly Pakistani females is very low as compare to males therefore equal representation of males and females was not possible. Age range of the sample was 60 to 96 years ($M = 64.22$, $SD = 6.72$). Education of participants was also categorized into 3 levels (secondary or less than, intermediate, graduate, and above).

Factor analysis. After try out, 60 items were retained and found suitable to run factor analysis. Exploratory factor analysis (EFA) was carried out on the sample of 506 participants through principle axis factoring by using the oblique rotation method. Tabachnick and Fidell (2007) stated that the best way to choose from the orthogonal or oblique rotation method is to run initially oblique rotation. If results reveal that factors are correlated with each other then it is enough evidence to warrant oblique rotation. Therefore oblique rotation method (direct oblimin) was used. Promax is considered a quick method as compare to direct oblimin but according to Kim and Mueller (1978) direct oblimin provides a more simple structure and beginners should select direct oblimin as compare to Promax. As a result of analysis three factors were established which were clear, well defined, interpretable and theoretically consistent.

Results. Table 1 shows the result of principal axis factoring with oblique method; three well defined factors are recognized. Items with .45 and more factor loadings that were not loaded on two or more than two factors were retained. Items with loading .45 or more than .45 on two or more factors were discarded and those items with less than .45 loading on all factors were also not retained. In order to finalize the number of factors, multiple criteria were used. Firstly results revealed that three factors had an eigenvalue >1. According to the Kaiser criterion, eigenvalues is a good criterion for determining a factor. If eigenvalues is greater than one, we should consider that a factor and if eigenvalues are less than one, then we should not consider that a factor. The scree plot demonstrated inflection at four factors. Therefore, in accordance with the Kaiser criterion of factor extraction, we retained three factors (total explained variance was 32.63%): moreover, it was considered that there must be at least three items in one factor (Marsh, Hau, Balla & Grayson, 1998; Robinson, 2017). The final factor structure was interpreted keeping in view the magnitude of factor loading and the theoretical relevance of the items to the respective factors. Keeping in view the content validity, 36 items were retained and alpha reliability of life regrets scale was found to be excellent ($\alpha = .92$).

Retained factors were named as familial regrets, religious regrets and personal growth related regrets.

Table 1 – The factor loading of 36 items on Life Regrets Scale and on three factor solution (N = 506)

		Factors		
Sr.	**Item**	**I** **Familial regrets**	**II** **Religious regrets**	**III** **Personal growth related regrets**
1	1	**.46**	.16	.17
2	2	**.49**	.14	.14
3	3	**.52**	.06	.18
4	4	**.49**	.17	.21
5	5	**.53**	.27	.27
6	6	**.57**	.28	.21
7	14	**.52**	.14	.28
8	24	**.70**	.15	.23
9	26	**.66**	.24	.30
10	29	**.61**	.19	–.12
11	32	**.59**	.30	.23
12	33	**.67**	.29	–.36
13	34	**.61**	.30	.23
14	7	.30	**.72**	.27
15	8	.20	**.70**	.29
16	9	.31	**.70**	.32
17	10	.25	**.71**	.25
18	11	.32	**.63**	.30
19	12	.18	**.69**	.33
20	13	.23	**.72**	.16
21	28	.34	**.60**	–.14
22	15	.18	.31	**.46**
23	16	.23	.06	**.46**
24	17	.16	.15	**.47**
25	18	.30	.22	**.52**
26	19	.24	.34	**.57**
27	20	.22	.20	**.57**
28	21	.31	.23	**.53**
29	22	.34	.32	**.54**
30	23	.11	.31	**.57**
31	25	.27	.32	**.61**
32	27	.32	.26	**.57**
33	30	.28	.31	**.50**
34	31	.37	.21	**.59**
35	35	.33	.19	**.51**
36	36	.29	.22	**.53**
Eigenvalues		20.30	3.96	2.77
% of variance explained		25.53	4.37	2.72
Cumulative variance		25.53	29.90	32.63

Study II: Confirmatory factor analysis

Confirmatory factor analysis was carried out on an independent sample of elderly people to verify the factor structure of the newly developed *Life Regrets Scale*.

Objectives

To verify the factor structure obtained through exploratory factor analysis.

Sample

Sample of the study comprised 200 participants, which included both males (n = 117) and females (n = 83). The age of sample ranged between 60 to 82 years (M = 65.51, SD = 6.06).

Instrument

Thirty six items scale selected on the basis of EFA, was used in this study.

Procedure

The participants of the study were approached at different venues and they were informed about the purpose of the study. After taking informed consent from participants, the questionnaires were distributed with written instructions among the willing participants. The scales were handed over and posted to a sample of 250 older adults. It took about 20-25 minutes to complete responses on a scale. Participants returned questionnaires by hand and some of them returned through the post. Some of the questionnaires were not returned by participants. 208 out of 250 (83%) forms were returned, while 200 were found suitable for study. Eight questionnaires were eliminated by the researcher because of incomplete and random responses.

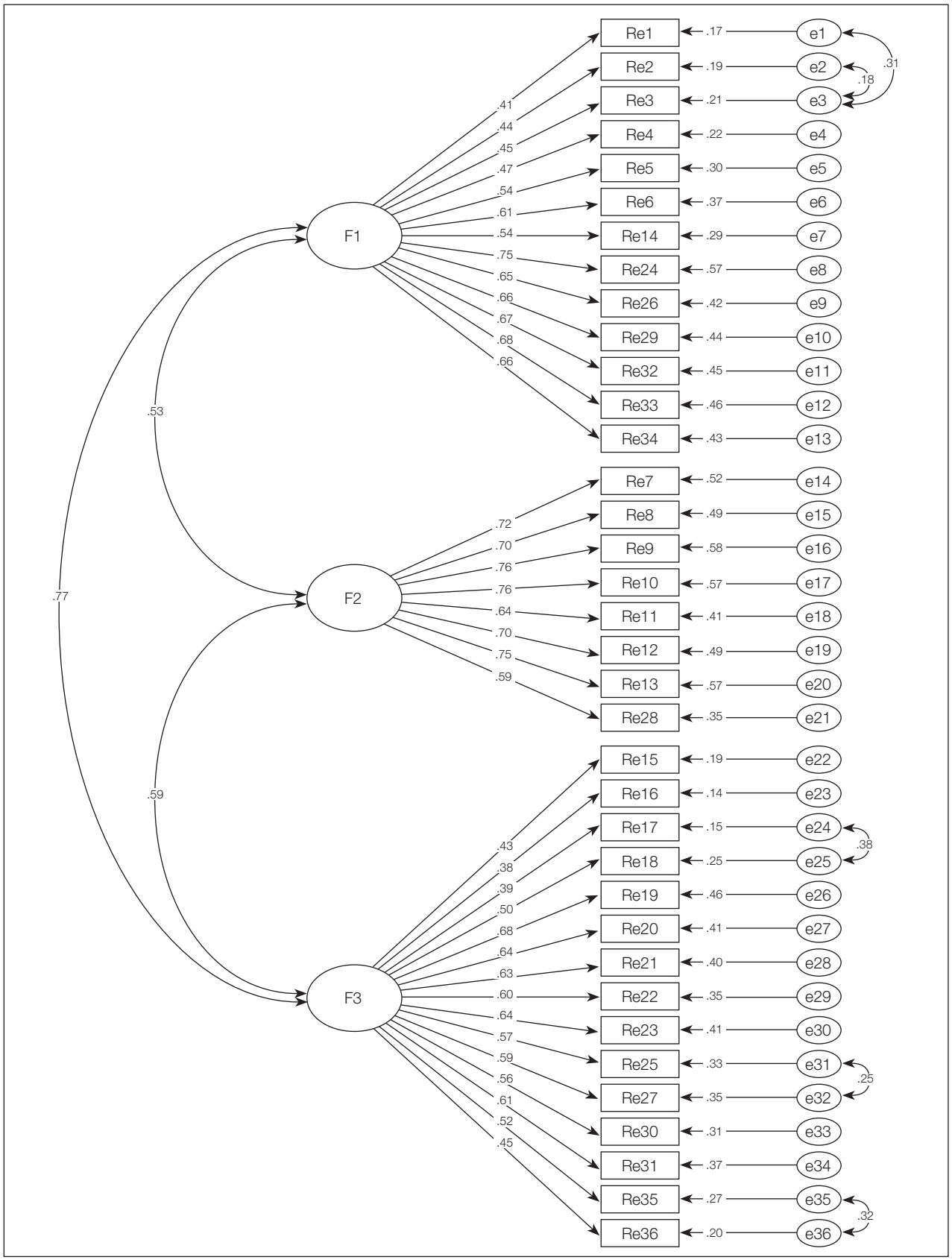
Table 2 and Figure 1 show the findings of factor loadings and model fit indices of CFA for *Life Regrets Scale*. The maximum likelihood extraction method was used to estimate the parameters and the fit indices of the model. Initially, factor analysis was carried out on single, two, and three factor structure. On the basis of initial criteria (i.e., item loading >.45), only the three factor structure model showed a good fit to the data with chi square 1233.5 (df = 586), CFI = .91, GFI = .91 and RMSEA = .04. The value of CFI and GFI is closer to 1 and value of RMSEA is closer to 0 which indicates good model fit. Though non-significant value of chi square is required for CFA but in social sciences, for large samples the chi square value will nearly always be significant, so it is suggested to divide the chi square value by degrees of freedom and it is supposed that a model with chi square/df less than three is good (Gable & Wolf, 1993; Hatcher, 1994;).The ratio of chi square and df for CFA was 2.10: it is less than 3 which represents a good model fit as it is falling in the acceptable range. The final model contains 36 items presenting a good model fit with 13 items in familial regrets, 8 in religious regrets and 15 items in personal growth and related regrets. The factor loadings ranged from .38 to .76. After CFA thirty six items were retained. Confirmatory factor analysis revealed correlations of some errors with in the factors. According to Meyer (2020), correlation of errors within factors are justifiable on the basis of nature of factor and items. Errors of item 1 and item 2 and 3 are correlated and these items are related to the regrets related to decisions about marriage and education of children. Similarly correlated errors of item 17 and 18 is justifiable as both items are related to regrets about being carelessness regarding personal health and diet plan. In the same line item 25 and item 27 both are related to expectations and dependence on others and these items are sharing conceptual overlap. Item 35 and 36 both are related with regrets about ignoring the self enjoyment in life. Though correlation of errors in CFA is discouraged but on the basis of conceptual overlap of these items correlated errors of within factor items are justifiable (Prudon, 2015).

Table 2 – Model fit indices of CFA for Life Regrets Scale (N = 200)

Indexes	χ^2	*df*	CFI	RMSEA	GFI	TLI	RMR
Model	1233.5	586	.91	.04	.91	.90	.06

Legenda. df = degree of freedom; CFI = *Comparative Fit Index*; RMSEA = *Root Mean Square Error of Approximation*; GFI = *Goodness of Fit Index*; TLI = *Tucker Lewis Index*; RMR = *Root Mean Residual*.

Figure 1 – Measurement model fit of Life Regrets Scale



Study III: Validation of Life Regrets Scale (LR-36)

Study III is an independent study designed to validate the *Life Regrets Scale*. For this purpose, the correlation of *Life Regrets Scale* was checked with anxiety and depression.

Sample

The sample of Study III comprised 141 older adults (including both males, n = 82, and females, n = 59) selected through purposiveconvenient sampling technique. The age of sample ranged from 60 to 90 years (M = 62.41, SD = 7.16). Education of participants was categorized into 3 levels (secondary or less than, intermediate, and graduates and above). The data was collected from different rural urban areas of Sargodha District.

Instruments

Following is the description of measures used as evidence of construct validity of *Life Regrets Scale* in the present study.

- *Arabic Scale of Death Anxiety*. The *Arabic Scale of Death Anxiety* was developed by Abdel-Khalek (2004). This scale consists of 20 items. The scale was translated and adapted in Urdu language by Ghayas and Batool (2016). The adapted version of this scale consists of 23 items. The response format of this scale is 5 point Likert, ranging from 0 = no, to 4 = very often. There was no reverse item in this scale. Cronbach alpha reliability of this scale was .94 and Spearman Brown coefficient was .92. The split half reliability of this scale was .86. This scale was validated on the older adults of Pakistan by Ghayas and Batool (2016) and her findings revealed excellent model fit indices (chi square/df = 2.46, CFI = .94, GFI = .92, TLI = .92, RMSEA = .05).
- *Depression Anxiety and Stress Scale (DASS)*. DASS is a brief 21 items scale developed by Lovibond and Lovibond (1995). In the present scale, only depression subscale (item 3, 5, 10, 13, 16, 17 and 21) was used. This scale was translated into the Urdu language by Farooqi and Habib (2010). The scale uses a 4 point response format, ranging from 0 = does not apply to me at all, to 4 = applied to me very much, or most of the time. There is no reverse item in this scale. Cronbach alpha reliability of DASS-D (depression subscale) for older adults was .87 (Gloster et al., 2008).
- *Ego Integrity Scale*. This scale, developed by Ryff and Heincke (1983), is based on Erikson's ego integrity concept. This scale consists of 16 items. Nine items are negatively phrased (item 3, 6, 7, 9, 10, 11, 12, 13 and 16). Internal consistency of the scale was .82 (Ryff & Hiencke, 1983). The scale was translated in the Urdu language by Ghayas and Batool (2016). The internal consistency reliability of the translated version of the scale was reported to be .80.
- *Quality of Life Scale (QLS)*. This scale was developed by the World Health Organization in 1985. This scale was translated into the Urdu language by Khan and his colleagues (2003). The scale consists of a 26-items self-administered questionnaire. The response format ranges from 1 to 5 for each question, with a high score depicting a high quality of life. The scale has good internal consistency (Cronbach's alpha reliability is .86). The test re-test reliability of the translated version of the *Quality of Life Scale* is .74.

Procedure

Through a convenient sampling technique, participants were approached at different venues to collect data. The questionnaires were handed over and posted to a sample of 180 participants. They were instructed to fill them individually. Informed consent was taken from the participants. The confidentiality of the provided information was assured. The demographic sheet was attached with the questionnaires. The participants were asked to provide correct and authentic information. Participants returned questionnaires by hand. and some of them returned through the post. Some of the questionnaires were not returned by participants. The response rate was satisfactory as 157 out of 180 (83%) forms were returned while 141 were found suitable for study. Sixteen questionnaires were discarded due to random responses and incomplete information. Keeping in view the characteristics of the sample response rate seems satisfactory as older adults have a different type of attitudes about research that may be one of the reasons behind the 83% response rate.

Results of validation study

Table 3 shows the mean, standard deviation, alpha reliability, skewness and kurtosis of the measures used in the current study.

Table 4 shows the relationship among study variables. Pearson correlation shows that *Life Regrets Scale* has significant and positive correlation with death anxiety (r = .42, p<.001) and depression (r = .53, p<.001). While *Life Regrets Scale* appeared as negative correlate of quality of life (r = –.32, p<.001) and ego integrity (r = –.47, p<.001).

Table 3 – Mean, standard deviation, alpha reliabilities and descriptives of life regrets and its correlates (N = 141)

				Range				
Variables	**n**	***M***	***SD***	**Actual**	**Potential**	**α**	**Skewness**	**Kurtosis**
LRS	36	81.33	21.68	36-180	39-167	.91	.25	–.37
ASDA	23	35.80	23.35	0-92	0-85	.94	.24	–.76
Dep	07	4.80	4.11	0-21	0-16	.81	.65	–.59
QoL	26	87.18	13.98	26-130	56-120	.89	.14	–.46
EI	16	50.30	5.66	16-80	18-48	.70	.19	.07

Legenda. LRS = *Life Regrets Scale; ASDA= Arabic Death Anxiety Scale;* Dep = Depression; QoL = Quality of life; EI = Ego integrity.
Standard error of skewness = .20; Standard error of kurtosis = .40

Table 4 – Pearson correlation among study variables (N = 141)

Variables	**1**	**2**	**3**	**4**	**5**
1. LR		.42***	–.47***	.53***	–.32***
2. DA		–	–.24**	.45***	–.24**
3. EI				–.39***	.43***
4. Dep					–.32***
5. QoL					

Legenda. LR = Life regrets; DA = Death Anxiety; EI = Ego integrity; Dep = Depression; QoL = Quality of life.
**p<.01, ***p<.001.

DISCUSSION

The present study aimed at developing a comprehensive and indigenous measure of life regrets for the elderly Muslim population of Pakistan. Several self-report measures have been developed all over the world to measure life regrets but a valid and reliable measure of life regrets for the Pakistani population did not exist. Already developed scales were not completely applicable on Pakistani culture. Some of the scales were not applicable due to cultural differences. Others were constructed and validated on age groups other than older adults. Life regret is a culture bound construct. People from different cultures have different types of regrets. In Pakistani culture, religious and interpersonal regrets are more common than other regrets, while in European cultures education related regrets are more common (Gilovich & Medvec, 1995). Hence, the present study was designed to develop a reliable and valid scale of life regrets specific to Pakistani culture.

The present research was comprised of three studies. In phase I of Study I, previous literature provided the theoretical foundations for item generation (Erikson, 1973; Ghayas & Batool, 2016; Pethtel, 2012; Tomer & Eliason, 2005). Qualitative interviews with older adults were also conducted for generating items.

Pilot study was carried out in the phase II, initially developed items of *Life Regrets Scale* were administered on a sample of 90 older adults. Some of the items were deleted due to non-normality and weak correlation while others were excluded on the basis of feedback obtained from older people.

In the phase III, in order to establish the factor structure of *Life Regrets Scale*, principal axis factoring was carried out upon 60 items. Exploratory factor analysis was incorporated to assess the data of 506 participants through oblique method. Oblique rotation method describes the related factors in factor analysis (Gorsuch, 1983). Tabachnick and Fidell (2007) suggested that oblique method was better than orthogonal method because it described the correlated factors while orthogonal method described the unrelated factors. In the present study, the oblique rotation method was used because all the latent constructs were theoretically correlated. Items showing high conceptual relevance and loading of .45 or greater were retained. According to Kaiser's (1960) criterion, three well established factors with 36 items were retained. These factors were named as familial regrets, religious regrets and personal growth related regrets. All three factors were clear, well defined, interpretable and theoretically consistent. Jointly three factors explained 32.63% of the total variance (see Table 2).

Study II was aimed at confirming the three-factor structure obtained through EFA. Confirmatory factor analysis was carried out on the life regrets scale (see Table 2 and Figure 1). CFA is more powerful than EFA because it provides hypothetical grounds for factor analysis (Gorsuch, 1983). In the present study, three-factor structure obtained through EFA was confirmed through CFA which showed a good model fit for the data with the total 36 items. This scale is a highly reliable scale which measures the regrets of Muslim older adults of Pakistan. This is a comprehensive measure of life regrets which measures regrets related to different domains of a person's life.

The first factor measures familial regrets related to interpersonal relationships with family (parents, siblings and children) and responsibilities toward the family. This factor explained the highest variance in this scale. A study conducted on older people by Keseberg (2017) showed that family was the main focus of old age. Older people evaluate their relationship with their family members and if they did not fulfill their responsibilities towards family members they experience regrets. In old age, the level of satisfaction and happiness was determined by their strong relationships with family members and successful fulfillment of their responsibilities. In contrast, if they had failed to accomplish their meaningful tasks or responsibilities, they developed feeling of regrets and despair (Kroger, 2007). In the present study, familial regrets subscale explained the highest variance in factor analysis (25.53%).

Items in the second factor measure regrets related to religious teachings and practices (such as offering prayers, reciting Quran etc.). This factor was named as religious regrets. In older age, people give more importance to their religious beliefs (Peck, 1968). When older people analyze their past life and realize that they could not perform their religious practices well, they feel more regret. A qualitative study conducted on the religiosity and regrets of Pakistani older people by Ghayas and Batool (2016) elucidated that older people have high religious regrets because when they realize that they did not fulfill their religious obligations because of worldly affairs, they develop a sense of guilt and remorse. Religious regrets explained second highest variance (4.73%) in *Life Regrets Scale* developed for elderly people of Pakistan.

Items related to third factor namely personal growth related factors measure regrets related to one's own self,

the choices one has made for himself and responsibilities towards oneself. This subscale shared the least variance in factor analysis of the *Life Regrets Scale*. In older age, a person's self is the lowest priority for him as his family and religious values are very important for him. A study conducted by Jones and McEvoy (2005), described that people experience the regret of inaction in the personal domain as compared to action. When they realize that they should have taken some important actions about themselves, they experience greater regrets. So in Pakistani culture, this factor explained less variance 2.72% as compared to other factors.

In order to find out gender differences in life regrets, independent sample *t*-test was carried out. Results revealed non-significant gender differences in regrets. Previously it is proved that males and females both experience equal level of regrets (Maximo, Berlanga, Aquisay, Valencia & Daoen, 2012). Interestingly results revealed effect of residential area on life regrets. Analysis portrayed higher level of regrets in people who belong to rural areas as compare to those who belong to urban areas. Results can be justified on the basis of difference in the culture of Pakistani urban and rural areas. Culture of rural areas is collectivistic culture where mostly people live in joint family system. In rural areas older adults are considered as head of their families and make decisions about their family members. Decision making is a big responsibility. Therefore, older adults feel themselves responsible for bad outcomes or consequences. On the other hand, in urban areas individualistic culture prevails where most of the people live in nuclear family system. In urban areas individuals usually takes decisions independently. Findings of previous researches elucidated that residential area significantly influence the regrets of older adults. individuals belong to collectivist culture might experience less regrets of inaction and greater regrets of action (Gilovich et al., 2003; Komiya, Oishi & Lee, 2016).

The results of present study showed that less educated people experience higher regrets as compared to highly educated people. The findings are in line with the previous literature, findings revealed highly educated people have a good sense of value and meaning for life and attain more achievements in their life which is linked with lower level of regrets as compared to less educated people (Joo & Chong, 2009). Another study conducted on the older adults of Pakistan showed that highly educated people have higher level of ego integrity as compared to less educated people. Ego integrity is result of past achievements and accomplishment of their goals. So in older age lower level of ego integrity is outcome of failure in life and attain their desired goals which causes feeling of regrets (Ghayas & Batool, 2016). Findings of present study are also supported by previous researches such as a study conducted by Roese et al. (2009) on the impact of education on regrets and depression which described that lower education level is the predictor of stronger regrets which cause depression.

Study III aimed at validation of the newly developed *Life Regrets Scale*. On the basis of previous literature, it was hypothesized that the correlation of regrets with depression, death anxiety, ego integrity and quality of life would provide strong evidence for the construct validation of *Life Regrets Scale*. The results showed that life regrets had significant and positive correlation with death anxiety and depression. These findings are in line with the literature as a study conducted on older adults, depicted that a person's feeling of having a well-lived life predicted greater life satisfaction and was associated with a low level of death anxiety (Lau & Cheng, 2011). Another study conducted on the relationship of life regrets and death anxiety elucidated that death anxiety was associated with person's inability to achieve his goals and a sense of regret (Lehto & Stein, 2009). A research conducted by Rylands and Rickwood (2001) suggested that when a person reviews his life and sees his past wrong decisions and choices, it badly influence his life and ultimately leads to depression. These findings were also supported by another study which reported that higher level of regret correlated with a high level of depression (Wrosch, Bauer & Scheier, 2005).

Correlation analysis also revealed that *Life Regrets Scale* appeared to be significant negative correlate of ego integrity and quality of life among older adults. These findings also provided strong evidence for the construct validity of *Life Regrets Scale.* Previous literature supports the findings of the current study as it was reported that having a high level of life regrets are indicator of low level of ego integrity (Ghayas & Batool, 2016; Torges, Stewart & Duncan, 2008) and decreased quality of life (Bauer & Wrosch, 2011; Wrosch & Heckhausen, 2002).

CONCLUSION

Findings of current research reflect that life regret is a culturally bound phenomenon and the newly developed scale of life regrets is a valid and reliable tool to measure the life regrets of the elderly population of Pakistan.

Limitations and future recommendation

In the present study, *Life Regrets Scale* was only validated on Muslim population of Pakistan. It is suggested that future researches validate this scale on both Muslim and non-Muslim population.

In all self-reported measures, social desirability could be a potential threat for internal validity. So it is better to use more than one tool or more than one method in order to decrease the level of social desirability.

There is a comparatively low level of literacy rate in the Pakistani older population (Rehman, Jingdong & Hussain, 2015), therefore, it was not possible to represent an equal number of males and females in the sample. Moreover, an equal number of participants were not included as per education, and residential areas in the present study which can affect the findings. It is suggested that future researchers should try to ensure the equal representation of gender, education and residential area in the sample of studies. Representativeness of sample will provide better picture of results.

The study has limited generalizability as the data was collected from some cities of Punjab only, so to increase the external validity, further studies should be conducted on larger and more diverse samples.

The present study has used the cross-sectional research design which might have caused certain problems, so the longitudinal research design is recommended for future studies.

Practical implications of the present study

Regret is a culture-bound emotion and so there is a need to use culturally relevant tools to assess life regrets. The findings of the current study are important as the development of the *Life Regrets Scale* will help in understanding older people's regrets in Pakistan. These findings can be very helpful for psychologists, psychiatrists, counselors, and psychotherapists for developing such programs that can help and train older people about how they can cope with their regrets.

The present findings could also be useful for people belonging to different age groups, especially young people, in terms of making them aware of older people's life regrets. The findings can help educate young people on how to make effective decisions to achieve their life goals and prevent regrets in older age.

As life regrets cause disturbance in the overall evaluation of life, psychotherapists can develop social programs to deal with the disturbance caused by regrets which will lead to a decrease in other psychological problems as well.

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